Claims:

1. A method for correcting humidity measurement results of a radiosonde in respect to errors resulting from radiative heat exchange, the radiosonde comprising at least a humidity sensor and a temperature sensor, **characterised** in that the method comprises the steps of:

determining correction values for humidity measurement results in different environmental conditions, said correction values being organized in a beforehand formed (10) data structure (20) or calculated by means of a beforehand determined mathematical function, said environmental conditions being determined as a function of at least one environmental conditions parameter, said environmental conditions parameter being a variable having an effect in the environment of the humidity sensor and said correction values being determined so that they correct errors resulting from radiative heat exchange,

measuring (12) environmental humidity U_m with said humidity sensor,

determining a current value of at least one environmental conditions parameter,

measuring (11) the environmental temperature T_T with said temperature sensor,

calculating (13) humidity sensor temperature T_U, by means of said measured environmental temperature T_T and said correction values, which are differences ΔT_U between the measured environmental temperature T_T and the humidity sensor temperature T_U and correspond to the determined current value of said at least one environmental conditions parameter, and

calculating (14) error-corrected humidity U by means of the calculated humidity sensor temperature T_U, the measured environmental temperature T_T and the measured environmental humidity U_m.

2. A method according to claim 1, **characterised** in that said environmental conditions parameter relates to at least one variable affecting the humidity

measurement result, such as pressure, environmental temperature, humidity, location altitude of the radiosonde, sounding time of the radiosonde, intensity of solar radiation, solar elevation angle, location of the radiosonde on the globe or ascending speed of the radiosonde.

3. A method according to any one of the preceding claims, **characterised** in that said differences ΔT_U between the environmental temperature T_T and the humidity sensor temperature T_U are determined based on comparison measurements.

4. A method according to any one of the preceding claims, **characterised** in that said differences ΔT_U between the environmental temperature T_T and the humidity sensor temperature T_U are determined as a function of air pressure P and solar elevation angle h.

5. A method according to any one of the preceding claims, **characterised** in that said differences ΔT_U between the environmental temperature T_T and the humidity sensor temperature T_U are determined as a function of saturation humidity rh dependent on temperature and of air pressure P.

6. A method according to any one of the preceding claims, **characterised** in that the method comprises

error-correcting the measured environmental temperature T_T before calculating the humidity sensor temperature T_U, and

using the error-corrected environmental temperature T_T in calculating the humidity sensor temperature T_U and the error-corrected humidity U.

7. A method according to any one of the preceding claims, **characterised** in that the humidity sensor temperature T_U is calculated in the following way:

$T_U = T_T + k_U \cdot \Delta T_U$, in which

T_T = environmental temperature measured with temperature sensor advantageously error-corrected,

k_U = ventilation factor in relation to a nominal value, and

ΔT_U = difference between environmental temperature and humidity sensor temperature in current environmental conditions.

8. A method according to any one of the preceding claims, **characterised** in that the error-corrected humidity U is determined in the following way:

$$U = \frac{e(T_T)}{e_w(T_T)} \cdot 100 = \frac{e_w(T_U)}{e_w(T_T)} \cdot U_m \text{, in which}$$

T_T = environmental temperature measured with temperature sensor advantageously error-corrected,

T_U = humidity sensor temperature,

U_m = measured humidity,

$e_w(T_U)$ = partial pressure of saturated water vapour in temperature T_U,

$e_w(T_T)$ = partial pressure of saturated water vapour in temperature T_T, and

$e(T_T)$ = actual vapour pressure in temperature T_T.

9. A data processing device (30) for correcting humidity measurement results of a radiosonde in respect to errors resulting from radiative heat exchange, the radiosonde comprising at least a humidity sensor and a temperature sensor, **characterised** by the data processing device comprising:

a memory (33) comprising correction values for humidity measurement results in different environmental conditions, said correction values being organized in a beforehand formed data structure (35) or calculated by means of a beforehand determined mathematical function stored in the memory (33), said environmental conditions being determined as a function of said at least one environmental conditions parameter, said environmental conditions parameter being a variable having an effect in the environment of the humidity sensor and said correction values being determined so that they correct errors resulting from radiative heat exchange,

receiving means (32) for receiving environmental humidity U_m measured with said humidity sensor and receiving environmental temperature T_T measured with said temperature sensor and receiving the current value of at least one environmental conditions parameter, and

calculation means (31, 34) for calculating the humidity sensor temperature T_U by means of said measured environmental temperature T_T and said correction values, which are differences ΔT_U between the measured environmental temperature T_T and the humidity sensor temperature T_U and correspond to the current value of said at least one environmental conditions parameter and for calculating error-corrected humidity U by means of the calculated humidity sensor temperature T_U, the measured environmental temperature T_T and the measured environmental humidity U_m.

10. A data processing device according to claim 9, **characterised** in that said data processing device is located in said radiosonde.

11. A computer program which provides a routine for correcting humidity measurement results of a radiosonde in respect to errors resulting from radiative heat exchange when running said computer program, the radiosonde comprising at least a humidity sensor and a temperature sensor, and said computer program communicating with

a memory comprising correction values for humidity measurement results in different environmental conditions, said correction values being organized in a beforehand formed data structure or calculated by means of a beforehand determined mathematical function stored in the memory, said environmental conditions being determined as a function of at least one environmental conditions parameter, said environmental conditions parameter being a variable having an effect in the environment of the humidity sensor and said correction values being determined so that they correct errors resulting from radiative heat exchange, said computer program comprising:

a program code for receiving environmental humidity U_m measured with

said humidity sensor and receiving environmental temperature T_T measured with said temperature sensor and receiving the current value of at least one environmental conditions parameter, and

a program code for calculating the humidity sensor temperature T_U by means of the measured environmental temperature T_T and said correction values, which are differences ΔT_U between the measured environmental temperature T_T and the humidity sensor temperature T_U and correspond to the current value of said at least one environmental conditions parameter and for calculating error-corrected humidity U by means of the calculated humidity sensor temperature T_U, the measured environmental temperature T_T and the measured environmental humidity U_m.

12. A computer program according to claim 11, stored in a storage medium.